

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A rotary expander which produces power by the expansion of supplied high-pressure fluid, the rotary expander comprising:

a plurality of rotary mechanism parts ~~(70, 80)~~, each of which includes: a cylinder ~~(71, 81)~~ whose both ends are blocked; a piston ~~(75, 85)~~ for forming a fluid chamber ~~(72, 82)~~ in the cylinder ~~(71, 81)~~; and a blade ~~(76, 86)~~ for dividing the fluid chamber ~~(72, 82)~~ into a high-pressure chamber ~~(73, 83)~~ on the high-pressure side and a low-pressure chamber ~~(74, 84)~~ on the low-pressure side; and

a rotating shaft ~~(40)~~ which engages with the piston ~~(75, 85)~~ of each of the plural rotary mechanism parts ~~(70, 80)~~;

wherein:

the plural rotary mechanism parts ~~(70, 80)~~ have different displacement volumes from each other, and are connected in series in ascending order of the different displacement volumes;

in regard to two mutually connected rotary mechanism parts among the plural rotary mechanism parts ~~(70, 80)~~ one of which is a front-stage side rotary mechanism part ~~(70)~~ and the other of which is a rear-stage side rotary mechanism part ~~(80)~~, the low-pressure chamber ~~(74)~~ of the front-stage side rotary mechanism ~~(70)~~ and the high-pressure chamber ~~(83)~~ of the rear-stage side rotary mechanism part ~~(80)~~ come into fluid communication with each other, resulting in the formation of a single expansion chamber ~~(66)~~, and fluid expands while flowing from the low-pressure chamber of the front-stage side rotary mechanism part into the high-pressure chamber of the rear-stage side rotary mechanism part; and

the rotary expander includes: an injection passageway ~~(37)~~ through which a part of the high-pressure fluid is introduced into the expansion chamber ~~(66)~~ in the process of expansion; and a distribution control mechanism provided in the injection passageway ~~(37)~~.

2. (Currently amended) The rotary expander of claim 1, wherein:

the cylinders (71, 81) of the plural rotary mechanism parts (70, 80) are stacked one upon the other in a layered manner with an intermediate plate (63) interposed therebetween;

each said intermediate plate ~~(63)~~ is provided with a communicating passageway ~~(64)~~ wherein, in regard to two adjacent rotary mechanism parts among the plural rotary mechanism parts ~~(70, 80)~~ one of which is a front-stage side rotary mechanism part ~~(70)~~ and the other of which is a rear-stage side rotary mechanism part ~~(80)~~, the low-pressure chamber ~~(74)~~ of the front-stage side rotary mechanism ~~(70)~~ and the high-pressure chamber ~~(83)~~ of the rear-stage side rotary mechanism part ~~(80)~~ are brought into fluid communication with each other by the communicating passageway ~~(64)~~; and

the injection passageway (37) is formed in the intermediate plate (63) so as to open, at a terminal end thereof, to the communicating passageway (64).

3. (Currently amended) The rotary expander of claim 1, wherein the injection passageway ~~(37)~~ opens, at a terminal end thereof, to the high-pressure chamber ~~(83)~~ of at least one rotary mechanism part among the plural rotary mechanism parts ~~(70, 80)~~ that has a displacement volume greater than the smallest displacement volume.

4. (Currently amended) The rotary expander of any one of claims 1-3, wherein the distribution control mechanism is formed by a regulating valve ~~(90)~~ the valve opening of which is regulatable.

5. (Currently amended) The rotary expander of any one of claims 1-3, wherein the distribution control mechanism is formed by an openable/closable solenoid valve ~~(91)~~.

6. (Currently amended) The rotary expander of any one of claims 1-3, wherein the distribution control mechanism is formed by a differential pressure regulating valve ~~(92)~~ the valve opening of which varies depending on the difference in pressure between fluid in the expansion chamber ~~(66)~~ and fluid which has flowed out of a rotary mechanism part ~~(80)~~ having the greatest displacement volume.

7. (Currently amended) The rotary expander of any one of claims 1-3, wherein fluid which is introduced into the high-pressure chamber ~~(73)~~ of a rotary mechanism part ~~(70)~~ having the smallest displacement volume is carbon dioxide above critical pressure.